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(54) CHILDPROOF DOSING DEVICE

KINDERSICHERE DOSIERVORRICHTUNG

DISPOSITIF DOSEUR A L'EPREUVE DES ENFANTS

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Description

[0001] The present invention relates to a childproof (child-resistant) device for holding and dispensing liquids, in particular medicines, which comprises a bottle, a cap, a hollow cylinder, and a reciprocating dispenser according to the preamble of claim 1, and a cap-dispenser combination for use in a bottle, according to the preamble of claim 8.

[0002] The administration of liquid medicines from a bottle normally requires that the administered amount is measured so as to agree with the prescribed amount. Well known measures are teaspoonfuls, tablespoonfuls, drops and milliliters, all of which are simply poured or taken out from the medicine bottle. Usually however, nothing prevents that the whole bottle is poured out and drunk, e.g. by children. Obviously, this problem is not limited to medicines, but also occurs with household and industrial liquids in bottles and similar containers.

[0003] A number of devices have been developed which allow a measured dose of medicine to be taken out of a bottle. Most of these are particularly designed so as to yield very accurate doses which can be selected and adjusted by the user. Less attention is usually paid to safety and the devices can often be pried open easily. Where due safety measures are provided, the resulting device is often complicated, expensive and difficult to operate. A simple and easy to handle device allowing one to take out only one single dose of medicine from a bottle at a time, is therefore felt to be an outstanding need. Abuse of major, dangerous quantities of medicine (or for that matter, of household or industrial liquids) is discouraged by requiring the user to repeat a number of uninteresting moves over and over again before such a dangerous amount can be extracted from the bottle.

[0004] The problem is solved by a device for holding and dispensing liquids such as medicines that provides precise dosages of the liquid as claimed in claim 1 and a cap-dispenser combination as claimed in claim 8.

[0005] Further features and modifications as well as the advantages of the new device according to the invention will be described hereinafter in more detail, by way of example, with reference to the accompanying drawings where :

Figure 1 shows a sectional view of a first device according to the invention ;
Figure 2 shows a sectional view of a cap with attached beaker and tear-off band ; and
Figure 3 is a sectional view of the top of a device wherein cap and cylinder are separate.

[0006] The present device (1) for holding and dispensing liquid medicines provides precise dosages of the medicine and comprises a bottle (2) for holding the liquid medicine, said bottle extending between a bottle bottom (3) and a bottleneck (4). The bottle is conveniently made out of glass or an acceptable rigid plastic such as polyethylene or polypropylene, and typically may have a capacity of 0.1 l.

[0007] The cap (5) is fastened such to the bottleneck (4) that is cannot be removed without heating, so that it cannot be pried off. A preferred system involves mating, snap-fitting rib and groove formations at the outside of the bottleneck and the inside of the cap. This system has the advantage that it can be assembled easily and automatically and cannot reasonably be disassembled without breaking. Further, said cap (5) is associated with a hollow cylinder (6) extending axially to near the bottle bottom (3) and having an open upper end and a lower end with one central opening (7).

[0008] The device of the invention further comprises a reciprocating dispenser fitting within the cylinder (6), comprising a barrel (8) and a plunger (9). The dispenser is effective in drawing up and dispensing single, measured doses of the liquid medicine. The barrel (8) includes an upper portion (10) having a larger diameter than the lower portion (11) for assuring an air- and liquid-tight fit between the upper portion (10) and the interior wall of the cylinder (6), and having a lower end with one central opening (12) that is aligned with the central opening (7) in the cylinder (6). The plunger (9) includes a piston (13) forming an air- and liquid-tight fit with the interior wall of the barrel (8), a graduated piston rod (14) and a knob (15).

[0009] The upper part of the barrel (8) is further provided with an annular flange (16) which juts outwards over the rim of the cylinder (6). The barrel has a height and inside diameter such that its chamber volume equals desired liquid medicine doses, typically ranging up to 5 ml.

[0010] The graduated piston rod is calibrated, preferably in units of volume, the zero line (empty dispenser) being aligned with the top of the annular flange (16) when the plunger is inserted completely in the barrel. A user of the present device should simply pull up the knob (15) of the plunger until the desired amount of medicine is indicated by the fact that the appropriate calibration on the piston rod is aligned with the top of the annular flange (16).

[0011] It should be noted that the liquid medicine can only be drawn up in the barrel (8) when said barrel is completely inserted in the cylinder (6). Only then does the upper portion (10) provide the necessary air-tight seal between barrel and cylinder and is the chamber volume defined by the inside of the barrel in fluid communication with the bottle (2) through the aligned openings (7) and (12) forming a conduit.

[0012] The length of the upper portion (10) having a larger diameter than the lower portion (11) preferably is small so that upon withdrawing the barrel (8) from the cylinder (6) the least possible liquid medicine is drawn up in the cylinder. Yet, its length should be sufficient to provide an air-tight seal when fully inserted in the cylinder.

[0013] Upon withdrawal of the dispenser from the cylinder, no amount of movements allows liquid medicine to be taken out or spilled. For example, upturning of the device causes the central opening (7) at the closed lower end of the cylinder to project in the air above the fluid level in the upturned bottle preventing the contents of the bottle to be poured or shaken out. Thus, a fully inserted dispenser provides the only means of getting medicine out of the bottle.

[0014] Advantageously, the device according to the present invention can further comprise a beaker (17) removably snap-fitting over an external flange (18) on the cap (5) (see Fig. 2). The beaker (17) is intended to be charged with the desired liquid medicine dose drawn up with the dispenser, and - if and when needed - with other liquids such as water or a beverage in order to dilute the medicine. The capacity of the beaker typically is about four to six times the maximum chamber volume of the dispenser. The provision of a beaker with the instant device should dissuade the user from for example discharging the medicine directly into the mouth and possibly contaminating the dispenser and eventually the contents of the device. At the same time the beaker provides a further protective seal for the device during storage.

[0015] In order to render the device tamperproof, the beaker (17) is advantageously connected to the cup (5) by a tear-off seal, strip or band (19). Thus the dispenser can be kept neatly covered up and cannot be contaminated, nor for that matter can the medicine in the device. The tear-off band should be removed only immediately prior to use and provides an easily discernable proof of non-tampering with the device. Removal of the tear-off band and the beaker enables the dispenser to be withdrawn from the cylinder.

[0016] The child-resistant character of the device according to the present invention can be further enhanced by substituting the beaker (17) by an art-known child-resistant outer screw cap removably fitting to the cap (5). Of particular utility in this regard are those child-resistant screw caps that can only be removed by exerting a depressing and rotating force. In the absence of said depressing force the outer cap is freely rotatable with respect to the cap (5). Evidently, such child-resistant outer screw caps are not fit to be used as beakers. The child-resistant outer screw cap and the snap-fitting cap (5) are advantageously connected to one another with a tear-off band (19) as described before.

[0017] Further it should be noted that the cap (5) and cylinder (6) need not necessarily form an integral part, but may consist of two separate parts and a washer (20) (see Fig. 3). In order to fasten the cylinder in the cap, the cylinder is provided with an external flange (21) extending radially. The washer (20) fits the external flange (21), juts over the rim of the bottleneck (4) and provides an air- and liquid-tight seal between the cap and cylinder.

[0018] The device according to the instant invention is easily assembled, including with automatic machinery, by pressing a cap (5) fitted with a reciprocating dispenser as described on a bottle filled with a suitable amount of liquid. The device can be stored, sold and used as supplied by the manufacturer. Besides its being childproof, simple and hygienic, the device according to the present invention has the further advantage that the cap (5), the cylinder (6) and the reciprocating dispenser can be manufactured in a range of different dosages each with different diameters and/or lengths. The combination of the cap (5) and reciprocating dispenser as described before, either assembled or not, with or without beaker (17) or child-resistant outer screw cap, are meant to comprise a further aspect of the present invention.

Claims

1. A device (1) for holding and dispensing liquids that provides precise dosages of the liquid, comprising

   a bottle (2) for holding the liquid, said bottle extending between a bottle bottom (3) and a bottleneck (4),
   a cap (5) which cannot be removed from the bottleneck without breaking,
   a hollow cylinder (6) integral with the cap (5) or fastened in the cap with a washer (20) in an air- and liquid-tight manner, the hollow cyclinder extending axially towards the borne bottom (3) and having an open upper end and a lower end with one-central opening (7),
   a reciprocating dispenser fitting within the cylinder (6) comprising a barrel (8) and a plunger (9), wherein the barrel (8) includes an upper portion (10) having a larger diameter than the lower portion (11) for assuring an air- and liquid-tight fit between the upper portion (10) and the interior wall of the cylinder (6) when the barrel is completely inserted into the cylinder, and having a lower end with one-central opening (12) that is aligned with the central opening (7) in the cylinder (6), and wherein the plunger (9) includes a piston (13) forming an air- and liquid-tight fit with the interior wall of the barrel (8), a graduated piston rod (14) and a knob (15), characterized in that the aligned openings (7, 12) form a conduit whereby withdrawal of the plunger draws liquid from the bottle into the barrel of the dispenser only when said fit between said upper portion (10) and said interior wall of said cylinder (6) is established.

2. A device according to claim 1 wherein the cap (5) snap-fits with rib and groove formations to the bottleneck (4).

3. A device according to claim 1 wherein the cap (5)

comprises an external flange (18), and said device further comprises a beaker (17) removably snap-fitting with said external flange.

4. A device according to claim 3 wherein the beaker (17) is connected to the cap (5) by a tear-off band (19).

5. A device according to claim 1 wherein a child-resistant outer screw cap is removably fitted to the cap (5).

6. A device according to claim 5 wherein the child-resistant outer screw cap is connected to the cap (5) by a tear-off band (19).

7. A device according to claim 1 wherein the cap (5) and the cylinder (6) associated therewith are separate, said cylinder comprising an external flange (21) extending radially, said device further comprising a washer (20) holding the separate cylinder by the external flange and providing an air- and liquid-tight fit between the cap and the cylinder.

8. A cap-dispenser combination for use with a bottle consisting of

a cap (5) capable of being placed on a bottle-neck such that it cannot be removed therefrom without breaking,

a hollow cylinder (6) integral with the cap (5) or fastened in the cap with a washer (20) in an air- and liquid-tight manner, the hollow cylinder extending axially towards the bottom of a bottle and having an open upper end and a lower end with one central opening (7), combined with a reciprocating dispenser fitting within the cylinder (6) comprising a barrel (8) and a plunger (9), wherein the barrel (8) includes an upper portion (10) having a larger diameter than the lower portion (11) for assuring an air- and liquid-tight fit between the upper portion (10) and the interior wall of the cylinder (6) when the barrel is completely inserted in the cylinder, and having a lower end with one-central opening (12) that is aligned with the central opening (7) in the cylinder (6), and wherein the plunger (9) includes a piston (13) forming an air- and liquid-tight fit with the interior wall of the barrel (8), a graduated piston rod (14) and a knob (15), characterized in that the aligned openings (7, 12) form a conduit, whereby withdrawal of the plunger can draw liquid from a bottle into the barrel of the dispenser only when said fit between said upper portion (10) and said interior wall of said cylinder (6) is established.

Patentansprüche

1. Vorrichtung (1) zum Aufnehmen und Spenden von Flüssigkeiten, die eine genaue Dosierung der Flüssigkeit bereitstellt und folgendes umfaßt:

eine Flasche (2) zur Aufnahme der Flüssigkeit, wobei sich die Flasche zwischen einem Flaschenboden (3) und einem Flaschenhals (4) erstreckt,
einen Deckel (5), der ohne Zerbrechen nicht von dem Flaschenhals entfernt werden kann,
ein Hohlrohr (6), das mit dem Deckel (5) integral ausgebildet oder in dem Deckel mit einer Unterlegscheibe (20) luft- und flüssigkeitsdicht befestigt ist, wobei sich das Hohlrohr axial zu dem Flaschenboden (3) erstreckt und ein offenes oberes Ende und ein unteres Ende mit einer mittleren Öffnung (7) aufweist,
ein in das Rohr (6) passender, sich hin- und herbewegender Spender, der einen Zylinder (8) und einen Stempel (9) umfaßt, wobei der Zylinder (8) einen oberen Teil (10) mit einem größeren Durchmesser als der untere Teil (11) zur Gewährleistung einer luft- und flüssigkeitsdichten Passung zwischen dem oberen Teil (10) und der Innenwand des Rohrs (6), wenn der Zylinder vollständig in das Rohr eingeführt ist, aufweist, und ein unteres Ende mit einer mittleren Öffnung (12) aufweist, die auf die mittlere Öffnung (7) in dem Rohr (6) ausgerichtet ist, und wobei der Stempel (9) einen Kolben (13), der mit der Innenwand des Zylinders (8) eine luft- und flüssigkeitsdichte Passung bildet, eine mit einer Skaleneinteilung versehene Kolbenstange (14) und einen Griff (15) enthält, dadurch gekennzeichnet, daß die aufeinander ausgerichteten Öffnungen (7, 12) eine Leitung bilden, wobei ein Zurückziehen des Stempels nur dann Flüssigkeit aus der Flasche in den Zylinder des Spenders saugt, wenn die Passung zwischen dein oberen Teil (10) und der Innenwand des Rohrs (6) hergestellt ist.

2. Vorrichtung nach Anspruch 1, bei der der Deckel (5) durch einen Schnappverschluß mit Rippen- und Nutenausbildungen auf den Flaschenhals (4) angebracht werden kann.

3. Vorrichtung nach Anspruch 1, bei der der Deckel (5) einen Außenflansch (18) umfaßt, und wobei die Vorrichtung weiterhin einen Becher (17) umfaßt, der durch Schnappverschluß an den Außenflansch lösbar angebracht werden kann.

4. Vorrichtung nach Anspruch 3, bei der der Becher (17) durch ein Abreißband (19) mit dem Deckel verbunden ist.

5. Vorrichtung nach Anspruch 1, bei der ein kindersicherer äußerer Schraubdeckel an dem Deckel (5) lösbar angebracht ist.

6. Vorrichtung nach Anspruch 5, bei der der kindersichere äußere Schraubdeckel durch ein Abreißband (19) mit dem Deckel (5) verbunden ist.

7. Vorrichtung nach Anspruch 1, bei der der Deckel (5) und das ihm zugeordnete Rohr (6) getrennt sind, wobei das Rohr einen sich radial erstreckenden Außenflansch (21) umfaßt, wobei die Vorrichtung weiterhin eine Unterlegscheibe (20) umfaßt, die das getrennte Rohr durch den Außenflansch festhält und zwischen dem Deckel und dem Rohr eine luft- und flüssigkeitsdichte Passung bereitstellt.

8. Deckel-/Spenderkombination zur Verwendung mit einer Flasche, die aus folgendem besteht:

einem Deckel (5), der so auf einen Flaschenhals angeordnet werden kann, daß er sich nicht ohne Zerbrechen davon entfernen läßt, einem Hohlrohr (6), das mit dem Deckel (5) integral ausgebildet oder in dem Deckel mit einer Unterlegscheibe (20) luft- und flüssigkeitsdicht befestigt ist, wobei sich das Hohlrohr axial zum Boden einer Flasche erstreckt und ein offenes oberes Ende und ein unteres Ende mit einer mittleren Öffnung (7) aufweist, kombiniert mit einem sich hin- und herbewegenden Spender, der in das Rohr (6) paßt und einen Zylinder (8) und einen Stempel (9) umfaßt, wobei der Zylinder (8) einen oberen Teil (10) mit einem größeren Durchmesser als der untere Teil (11) zur Gewährleistung einer luft- und flüssigkeitsdichten Passung zwischen dem oberen Teil (10) und der Innenwand des Rohrs (6), wenn der Zylinder vollständig in das Rohr eingeführt ist, aufweist, und ein unteres Ende mit einer mittleren Öffnung (12) aufweist, die auf die mittlere Öffnung (7) in dem Rohr (6) ausgerichtet ist, und wobei der Stempel (9) einen Kolben (13), der mit der Innenwand des Zylinders (8) eine luft- und flüssigkeitsdichte Passung bildet, eine mit einer Skaleneinteilung versehene Kolbenstange (14) und einen Griff (15) enthält, dadurch gekennzeichnet, daß die aufeinander ausgerichteten Öffnungen (7, 12) eine Leitung bilden, wobei ein Zurückziehen des Stempels nur dann Flüssigkeit aus der Flasche in den Zylinder des Spenders saugen kann, wenn die Passung zwischen dem oberen Teil (10) und der Innenwand des Rohrs (6) hergestellt ist.

Revendications

1. Dispositif (1) pour contenir et distribuer des liquides fournissant des doses précises de liquide, comprenant

une bouteille (2) pour contenir le liquide, ladite bouteille s'étendant entre un fond de bouteille (3) et un col de bouteille (4),
un couvercle (5) qui ne peut être retiré du col de la bouteille sans être cassé,
un cylindre creux (6) formé d'une pièce avec le couvercle (5) ou attaché dans le couvercle avec une rondelle (20) de manière étanche à l'air et aux liquides, le cylindre creux s'étendant axialement vers le fond de la bouteille (3) et ayant une extrémité supérieure ouverte et une extrémité inférieure avec une ouverture centrale (7),
un distributeur à mouvement alternatif s'ajustant à l'intérieur du cylindre (6), comprenant un canon (8) et un plongeur (9), dans lequel le canon (8) comporte une portion supérieure (10) ayant un plus grand diamètre que la portion inférieure (11) pour assurer un ajustement étanche à l'air et aux liquides entre la portion supérieure (10) et la paroi intérieure du cylindre (6) lorsque le canon est complètement inséré dans le cylindre, et ayant une extrémité inférieure avec une ouverture centrale (12) qui est alignée avec l'ouverture centrale (7) dans le cylindre (6), et dans lequel le plongeur (9) comporte un piston (13) formant un ajustement étanche à l'air et aux liquides avec la paroi intérieure du canon (8), une tige de piston graduée (14) et un bouton (15), caractérisé en ce que les ouvertures alignées (7, 12) forment un conduit par le biais duquel le retrait du plongeur extrait du liquide de la bouteille dans le canon du distributeur uniquement lorsque ledit ajustement entre ladite portion supérieure (10) et ladite paroi intérieure dudit cylindre (6) est établi.

2. Dispositif selon la revendication 1, dans lequel le couvercle (5) s'emboîte par encliquetage avec des formations de nervure et rainure sur le col (4) de la bouteille (4).

3. Dispositif selon la revendication 1, dans lequel le couvercle (5) comprend une bride externe (18), et ledit dispositif comporte en outre un gobelet (17) s'emboîtant par encliquetage de manière détachable sur ladite bride externe.

4. Dispositif selon la revendication 3, dans lequel le gobelet (17) est connecté au couvercle (5) par une bande de déchirure (19).

5. Dispositif selon la revendication 1, dans lequel un couvercle vissé externe à l'épreuve des enfants est ajusté de manière détachable sur le couvercle (5).

6. Dispositif selon la revendication 5, dans lequel le couvercle vissé externe à l'épreuve des enfants est connecté au couvercle (5) par une bande de déchirure (19).

7. Dispositif selon la revendication 1, dans lequel le couvercle (5) et le cylindre (6) associé à celui-ci sont séparés, ledit cylindre comprenant une bride externe (21) s'étendant radialement, ledit dispositif comprenant en outre une rondelle (20) retenant le cylindre séparé par la bride externe et assurant un ajustement étanche à l'air et aux liquides entre le couvercle et le cylindre.

8. Combinaison de distributeur à couvercle pour l'utilisation avec une bouteille se composant

d'un couvercle (5) susceptible d'être placé sur un col de bouteille de telle sorte qu'il ne puisse pas être retiré de celui-ci sans être cassé,
d'un cylindre creux (6)formé d'une pièce avec le couvercle (5) ou attaché dans le couvercle avec une rondelle (20) de manière étanche à l'air et aux liquides, le cylindre creux s'étendant axialement vers le fond d'une bouteille et ayant une extrémité supérieure ouverte et une extrémité inférieure avec une ouverture centrale (7), combiné à un distributeur à mouvement alternatif s'ajustant à l'intérieur du cylindre (6), comprenant un canon (8) et un plongeur (9), dans lequel le canon (8) comporte une portion supérieure (10) ayant un plus grand diamètre que la portion inférieure (11) pour assurer un ajustement étanche à l'air et aux liquides entre la portion supérieure (10) et la paroi intérieure du cylindre (6) lorsque le canon est complètement inséré dans le cylindre, et ayant une extrémité inférieure avec une ouverture centrale (12) qui est alignée avec l'ouverture centrale (7) dans le cylindre (6), et dans lequel le plongeur (9) comporte un piston (13) formant un ajustement étanche à l'air et aux liquides avec la paroi intérieure du canon (8), une tige de piston graduée (14) et un bouton (15), caractérisé en ce que les ouvertures alignées (7, 12) forment un conduit par le biais duquel le retrait du plongeur peut extraire du liquide d'une bouteille dans le canon du distributeur uniquement lorsque ledit ajustement entre ladite portion supérieure (10) et ladite paroi intérieure dudit cylindre (6) est établi.

FIG. 1

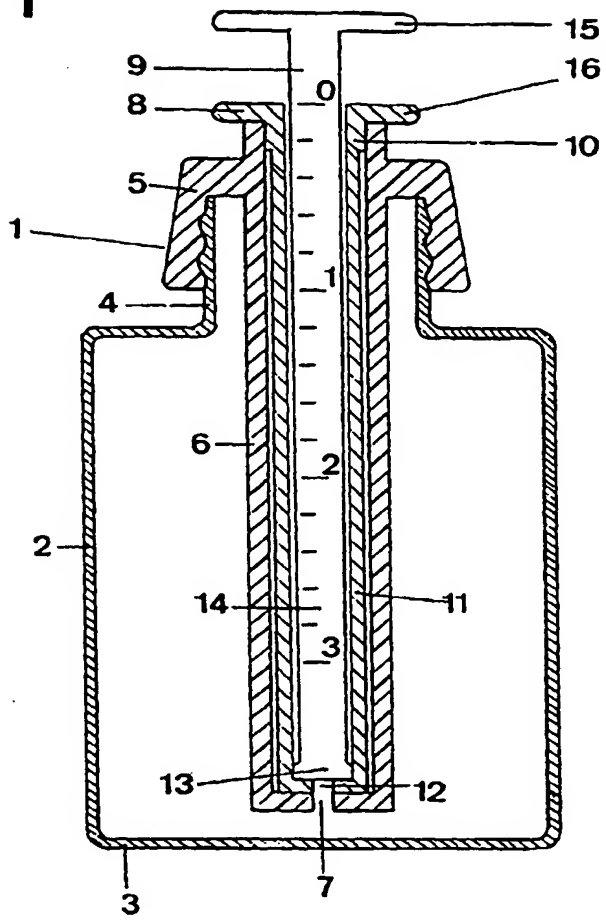

FIG. 2

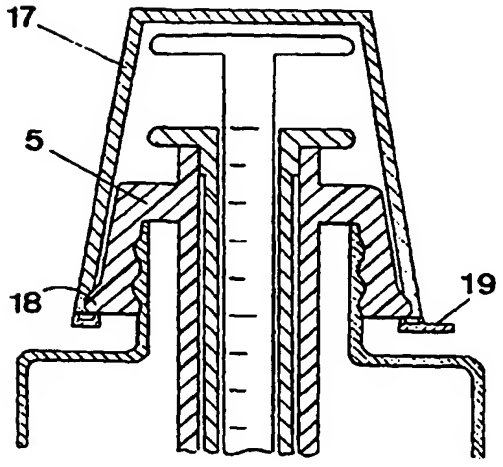

FIG. 3